SEC.492

What is claimed is :

1. A chemical composition for dissolving silicon carbide, quartz, aluminum oxide, or zirconium, comprising equal amounts by volume of sulfuric acid, hydrogen fluoride, and nitric acid.

2. A method of analyzing contaminants adhering to a sample taken from semiconductor device fabrication equipment comprising:

a) immersing the sample in a chemical composition comprising equal amounts by volume of sulfuric acid, hydrogen fluoride, and nitric acid;

b) dissolving the sample in the chemical composition;

c) cooling the dissolved sample to room temperature;

d) diluting the dissolved sample with deionized water; and

e) analyzing the diluted sample.

3. The method of claim 2, further comprising after said cooling, removing any fumes contained in the dissolved sample.

4. The method of claim 3, wherein said removing further comprises irradiating infrared light onto the dissolved sample surface using an infrared lamp in order to

increase the temperature of the dissolved sample thereby causing any fumes in the dissolved sample to evaporate.

5. The method of claim 4, wherein during said removing, the temperature of the dissolved sample is increased to between about 60°C and 80°C by irradiating the sample with the infrared lamp.

6. The method of claim 2, wherein the immersing further comprises,

(a) adding the chemical composition and the sample to a sample container,

(b) sealing the sample container,

(c) placing the sealed sample container in a pressure container for further sealing,

(d) placing the pressure container into a temperature-variable dry oven, and

(e) raising the temperature in the dry oven to thereby heat the chemical and the sample in the sample container.

7. The method of claim 6, wherein said raising the temperature further comprises,

(a) increasing the inner temperature of the dry oven sequentially to a first lower inner temperature and then to a second higher inner temperature, and

(b) maintaining the second higher inner temperature for a predetermined period of time that permits the sample to dissolve.

8. The method of claim 7, wherein the first lower inner temperature is in a range of from about 100°C to about 140°C.

9. The method of claim 7, wherein the second higher inner temperature is in a range of from about 200°C to about 260°C.

10. The method of claim 7, wherein said increasing of the inner temperature of the dry oven to the second higher inner temperature is performed with a temperature cycling sequence comprising,

(a) increasing the inner temperature of the dry oven for about 140 to 160 seconds after the first lower inner temperature has been reached, until an intermediate temperature is reached, the intermediate temperature being above the first lower inner temperature and below the second higher inner temperature;

(b) maintaining the first intermediate temperature reached in (a) for 3 to 6 seconds;

(c) decreasing the inner temperature of the dry oven for 45 to 55 seconds;

(d) increasing the inner temperature of the dry oven for about 140 to 160 seconds until another higher intermediate temperature is reached;

(e) maintaining the higher intermediate temperature reached in (d) for 3 to 6

seconds;

(f) decreasing the inner temperature of the dry oven for 45 to 55 seconds;

(g) repeating (d), (e) and (f) until the second higher inner temperature is reached.

11. The method of claim 2, wherein the sample contains one of silicon carbide, quartz or zirconium.

12. The method of claim 11, wherein the second higher inner temperature is maintained for about 22 to 26 hours to dissolve the sample.

13. The method of claim 2, wherein the cooling of the dissolved sample further comprises, decreasing the inner temperature of the dry oven, and removing the pressure container from the dry oven.

14. The method of claim 13, wherein decreasing the inner temperature of the dry oven is carried out for 20 to 40 minutes.

15. The method of claim 2, wherein said diluting is achieved by making a solution of about 10 to 20 weight percent of the dissolved sample and about 80 to 90 weight percent of deionized water.

16. The method of claim 2, wherein the analyzing is accomplished using an Atomic Absorption Spectrometer.

17. The method of claim 2, wherein the analyzing is accomplished using an Atomic Emission Spectroscope.

18. The method of claim 2, wherein during said immersing, about 0.1 to 0.3 g of the sample is immersed in about 10 to 20 ml of the chemical composition.

19. The method of claim 7, wherein the sample is aluminum oxide.

20. The method of claim 19, wherein the second higher inner temperature is maintained for about 45 to 55 hours to dissolve the sample.